COMSPHERE 3800 SERIES MODEMS

MODELS 3810, 3811, AND 3820

QUICK REFERENCE

Document No. 3810-A2-GL10-00

PARADYNE™

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October 1998

Electronic User Documentation

For more information, see the *COMSPHERE 3800 Series Modems, Models 3810, 3811, and 3820, User's Guide* (Document No. 3810-A2-GB30). The User's Guide is provided on diskette. It may be installed on a PC using Microsoft Windows 3.1 or above, then browsed or printed using the Adobe Acrobat Reader. The Reader is available at no charge at Adobe's World Wide Web site:

http://www.adobe.com

If it does not already exist, install the Adobe Acrobat Reader on your PC.

Installing the Documentation

The user documentation may be in a compressed format. Before installation, please read the *aboutdoc.txt* file on the diskette for appropriate installation instructions.

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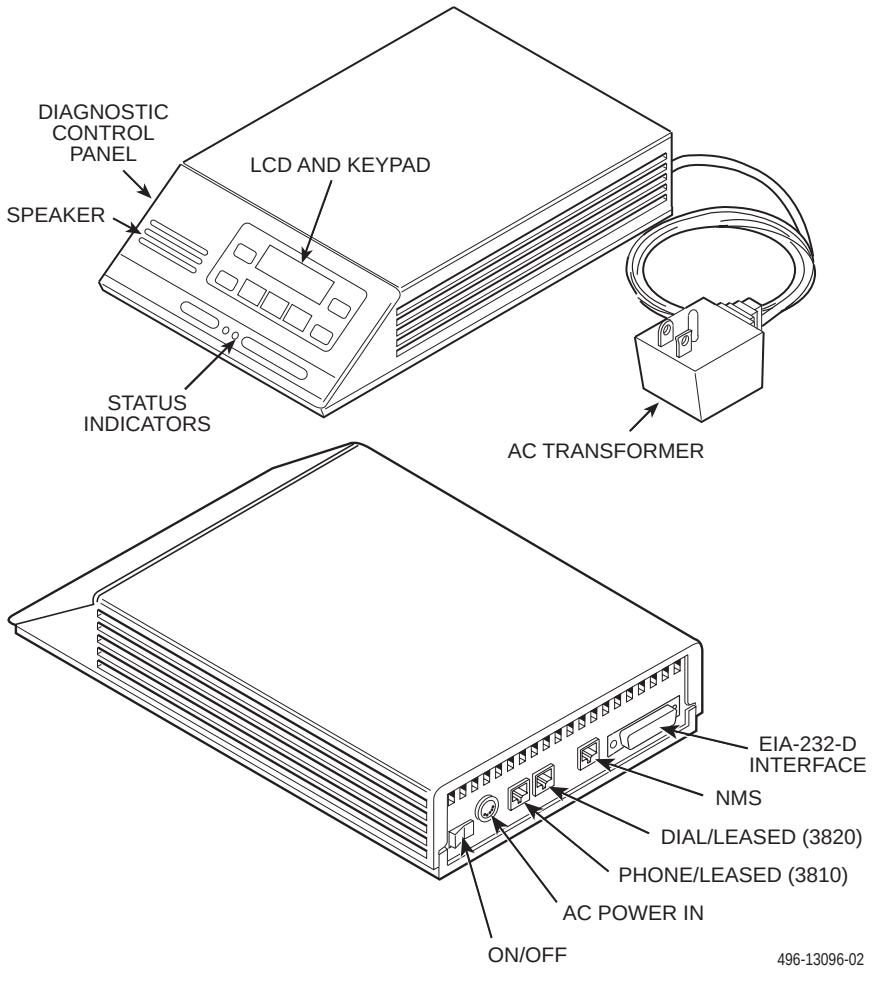
For best viewing:

1. Use your operating system's file manager to copy the PDF file to your hard disk, then use the Adobe Acrobat Reader to open the file from your hard disk. This is not required, but makes browsing through the document smoother and faster.
2. Maximize the Adobe Acrobat window so that it occupies the full screen.
3. Use the bookmarks along the left side to move around in the guide, the Index to find specific topics, and the Find tool to search for particular text.
4. Once you find the topic you wish to read about, use the View menu to select Page Only and Fit Visible.

Models 3810 and 3820 Installation



Customer-Supplied Equipment for Models 3810 or 3820

The following customer-supplied equipment is required to complete a data communications system using either the Model 3810 or Model 3820 modem:

- A DTE with an available EIA-232-D serial port.
- A standard EIA-232-D male-to-female cable with a male DB-25-S connector at one end to attach to the modem.
- One of the following modular dial or leased network interfaces:
  - — RJ11C for dial permissive applications
  - — An 8-position to 6-position crossover cable for JM8 leased-line applications only

Model 3810 or 3820 Telephone Connection

Use the following procedures to connect the modem to a telephone:

1. Insert the 6-position, 4-conductor modular plug into the jack labeled PHONE/LEASED (3810).
2. Insert the other end of the modular cord into the telephone.

Dial Network Management System Connection

For Model 3810 and 3820 modems, use the following procedures to connect the modem to the network management system interface:

1. Insert the subminiature 4-conductor modular plug of the 3600 Hubbing Device into the jack labeled NMS.
2. Connect the 3600 Hubbing Device to the network management system.

Refer to the *3600 Hubbing Device, Feature Number 3600-F3-300, Installation Instructions* (3610-A2-GZ45) for more information. Installation for the Model 3810 and 3820 modems is the same as for the 3610 DSU.

AC Power Transformer Connection

Use the following procedures to connect the modem to an ac power outlet:

1. Make sure the modem's power switch is in the Off position.
2. Insert the power transformer's 5-pin DIN male connector into the modem's rear panel ac power receptacle.
3. Insert the power transformer into a grounded ac power outlet.

Model 3810 Dial Connection

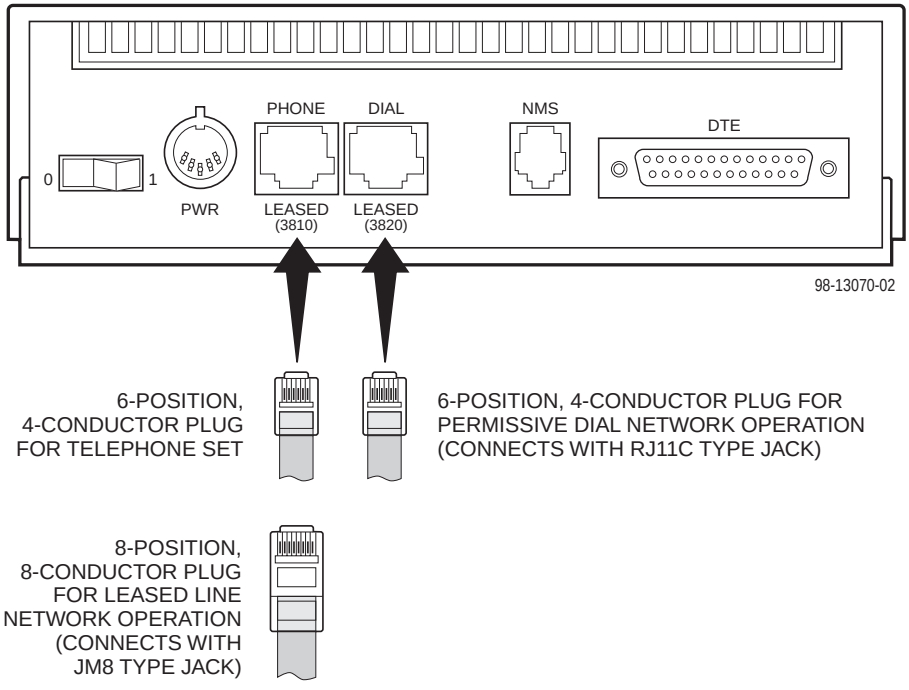
For the Model 3810, use the following procedures to connect the modem to the dial network interface:

1. Insert the 6-position, 4-conductor modular plug into the jack labeled DIAL/LEASED (3820).
2. Insert the other end of the modular cord into the network interface.

Model 3810 Leased Line Connection

Use the following procedures to connect a Model 3810 to the 2-wire or 4-wire leased-line network interface:

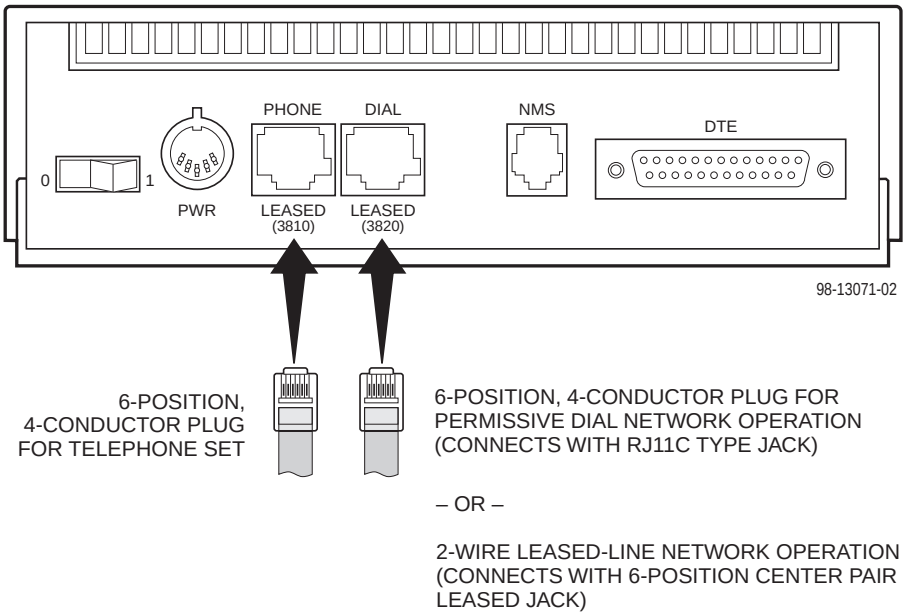
1. Insert the 8-position, 8-conductor modular plug into the jack labeled PHONE/LEASED (3810).
2. Insert the other end of the modular cord into the leased-line network interface.



Model 3820 Network Connection

Use the following procedures to connect a Model 3820 to the dial or 2-wire leased-line network interface:

1. Insert the 6-position, 4-conductor modular plug into the jack labeled DIAL/LEASED (3820).
2. Insert the other end of the modular cord into the network interface.



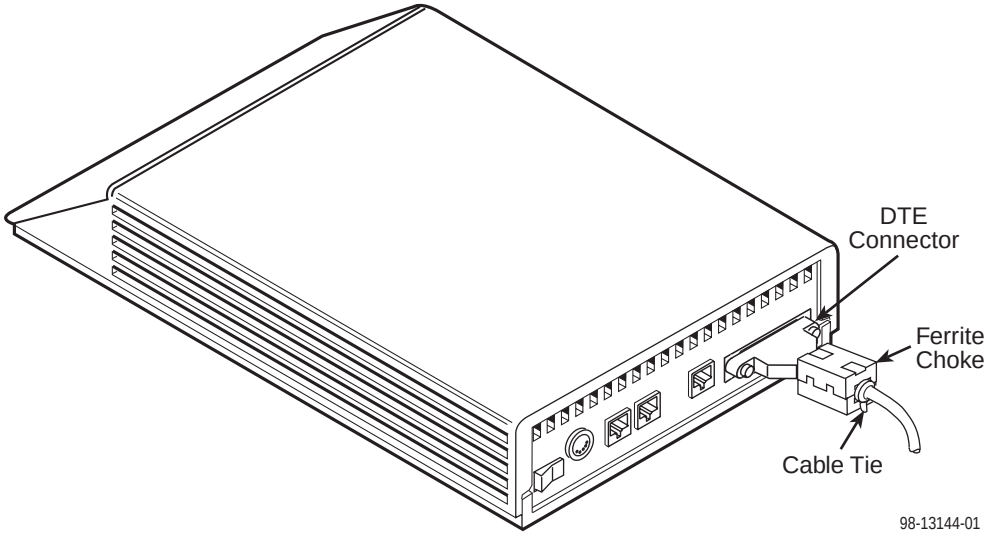
DTE Connection

Use the following procedures to connect the EIA-232-D cable and ferrite choke from the modem to the DTE:

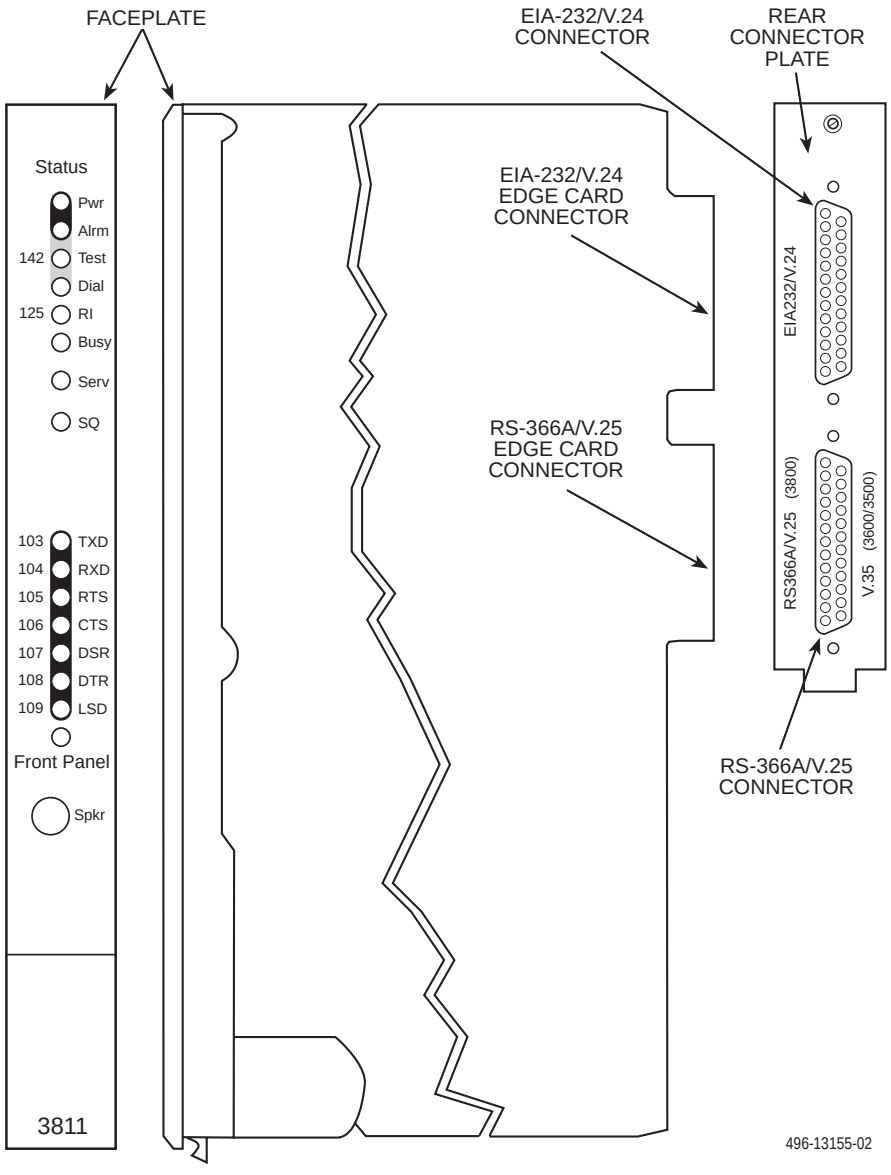
1. Make sure the modem's rear panel power switch is Off.
2. Connect the DB-25 plug on the cable to the DB-25 socket labeled DTE on the modem's rear panel. Use a small screwdriver to fasten the cable to the modem.
3. Connect the other end of the cable to the DTE. Use a small screwdriver to fasten the cable to the DTE.

To ensure compliance with FCC Part 15 Regulations, a ferrite choke must be installed on the EIA-232-D interface cable.

1. Open the ferrite choke and place it around the DTE cable as close as possible to the connector attached to the modem.
2. Close the two halves around the cable and snap the ferrite choke shut, pressing down on the plastic latch to secure it.
3. Install a cable tie behind the ferrite choke to prevent it from sliding along the cable.



Model 3811 Installation



Customer-Supplied Equipment for Model 3811

The following customer-supplied equipment is required for the installation of a Model 3811 modem:

- A COMSPHERE 3000 Series Carrier.
- A male-to-female 50-pin mass termination cable. One Network Interface Module (NIM) for modems installed in Slots 1–8 and one NIM for modems installed in Slots 9–16 (required for dial-line applications).
- One of the following modular or 50-pin dial or leased network interfaces:
  - — RJ11C for single line dial permissive applications
  - — RJ21X for multiple line dial permissive applications
  - — 66 punchdown block or other demarcation device
- One 6-position to 6-position modular cord (required for network management applications).
- A Shared Diagnostic Unit (SDU) (required for network management applications).

Model 3811 Installation

The Model 3811 is designed for installation in a COMSPHERE 3000 Series Carrier which supplies operating power and the dial and/or leased-line network connections. For correct power, DTE, dial-line, leased-line, NIM, and network management cabling information, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*, Document No. 3000-A2-GA31.

The installation of a Model 3811 varies slightly if an SDCP is installed on the front of the carrier. To install a Model 3811 modem into the carrier without an SDCP, perform the following steps:

CAUTION

If the Model 3811 is removed from the carrier, always use a ground strap when handling the modem. Always store the Model 3811 in an antistatic bag when it is removed from the carrier.

1. At the rear of the carrier, install the rear connector plate. Make sure the plate uses the same slot position as that intended for the modem.

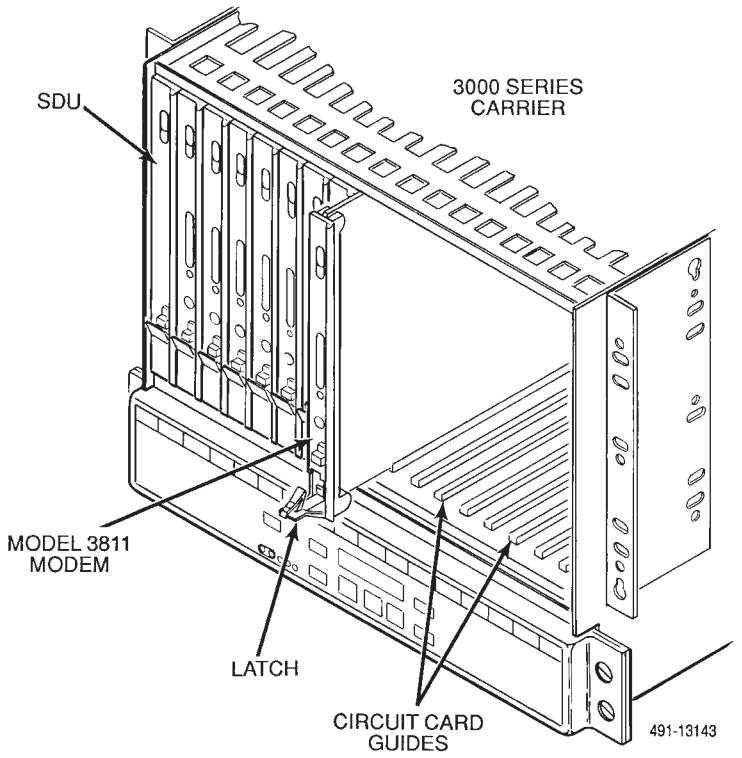
   — Loosely fasten the plate. This allows for slight adjustments later when installing the modem.

2. At the front of the carrier, hold the modem vertically, with the latch on its faceplate in the open position, and insert it into the top and bottom card guides of one of the slots numbered 1–16.

   — Slide the modem into the slot, aligning the modem with the rear connector plate, until the backplane connector and DTE connector seat firmly into the back of the carrier. The faceplate latch automatically closes as you push the modem into the carrier. To lock the modem into the carrier, press the faceplate latch until a click is heard.

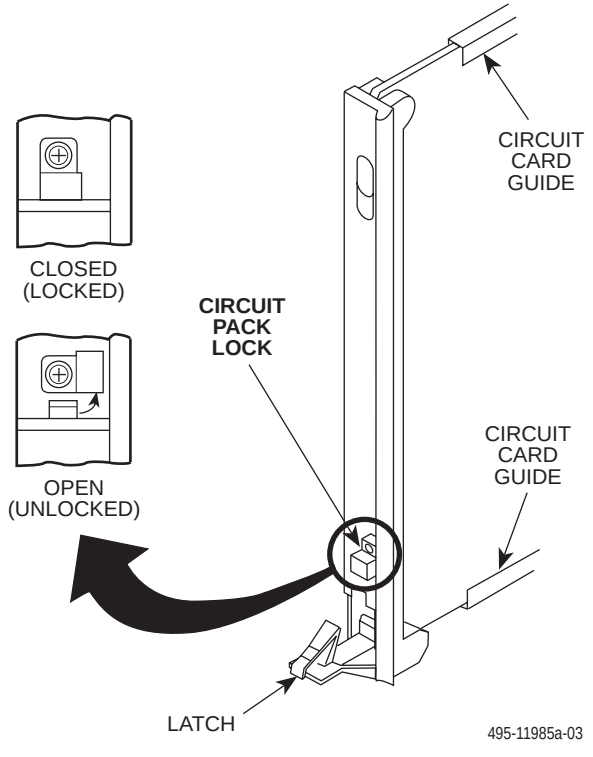
3. If the carrier is ON, the **Power** LED on the faceplate of the 3811 lights. After several seconds the modem completes its power-up self-test in which all faceplate LEDs light. If the modem fails, the **Alrm** LED on the faceplate flashes.

   — Return to the rear of the carrier and tighten the rear connector plate.



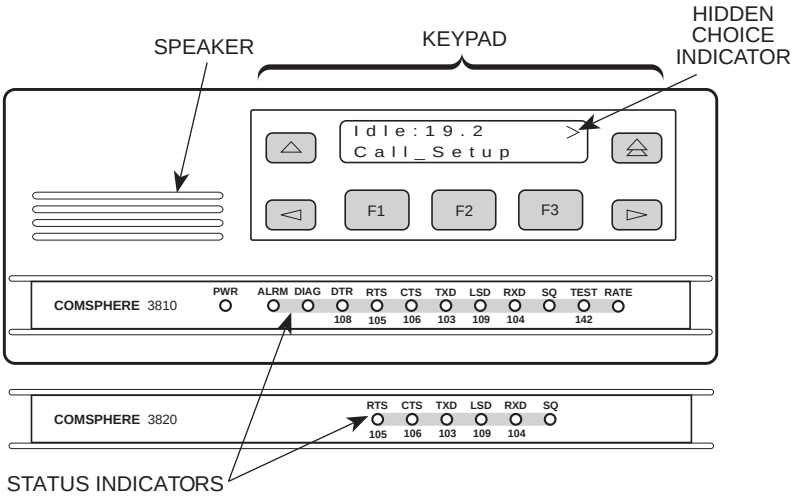
If the modem is to communicate with an installed SDCP, install the modem as described above and perform the following steps:

1. Press the Select key on the SDCP. The cursor appears in the carrier selection entry.
2. Press the F1 (↑) or F2 (↓) key until the carrier number you want appears on the LCD.
3. Press the ▻ key to position the cursor on the slot selection entry.
4. Press the F1 (↑) or F2 (↓) key until the slot number (1–16) you want appears on the LCD.
5. Press the Select key to place the SDCP in direct communication with the selected modem.
   — The LCD displays the Top-Level menu for the selected modem. In addition, the Front Panel LED on the modem's faceplate and the OK LED on the SDCP light.
6. Once you have determined that the modem is installed properly and completed its power-up self-test, rotate the circuit pack lock until it covers the faceplate latch. This prevents the modem from accidently being removed once it is installed in a carrier.



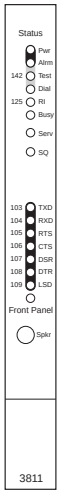
Diagnostic Control Panel (DCP) – Models 3810 and 3820

The DCP is the user interface to the modem. It provides a 2-line, 32-character liquid crystal display (LCD), a keypad, speaker grill, and status indicators.



Shared Diagnostic Control Panel (SDCP) – Model 3811

The SDCP is used to manage carrier-mounted 3811 modems. The Select key is used to connect the SDCP to a modem or other device in a specific carrier and slot location. Press the Select key, then enter the modem carrier (1–8) and slot (1–16) numbers. The Front Panel LED lights up on the selected modem. Once the modem is selected, operation of the SDCP is the same as for the standalone DCP.

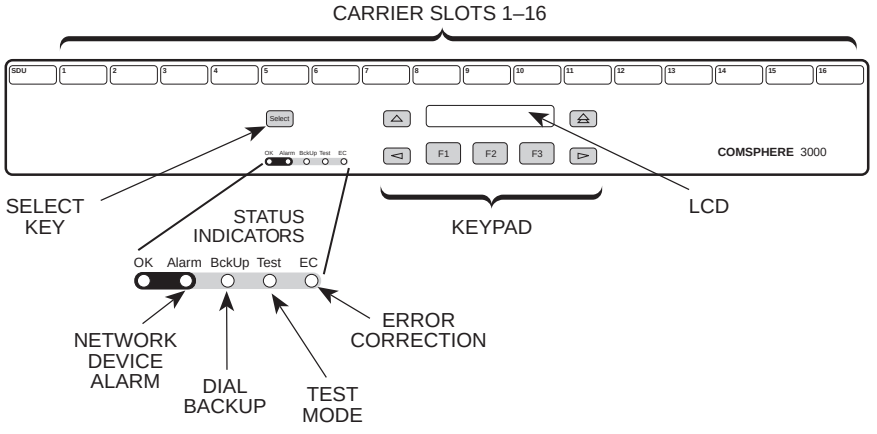


Direction and Function keys provide operator control.

△	Moves up one level from the current display.
◁ and ▷	Moves cursor or display to the left or right.
△ (double)	Returns display to Top-Level menu.
F1, F2, F3	Selects item displayed directly above the key.

Hidden Choice Indicators.

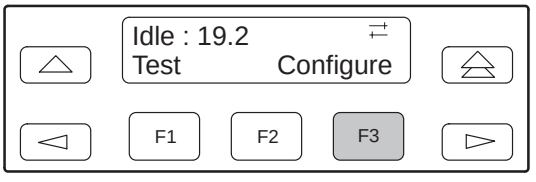
< >	Indicates more LCD selections are available to the left or right of what is currently displayed on the LCD.
Nxt	Indicates more configuration options are available below what is currently displayed. Also indicates selected configuration option.
End	Indicates last configuration option available for that group.



Configuration Option Procedures — DCP Commands

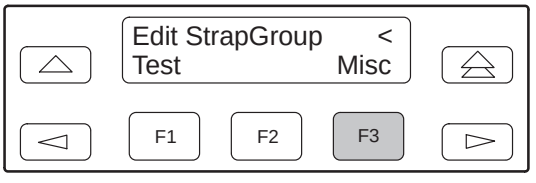
1. Move to the Configure branch and select a configuration area to load from: Active (Operating), Active (Saved), Customer 1, Customer 2, or Factory (Async Dial, Sync Dial, Sync Leased, or UNIX Dial). If Enhanced Throughput Cellular (ETC) is installed, Factory areas Cellular (Mobile) and Cellular (PSTN) are also available.

Select Configure from the Top-Level menu.

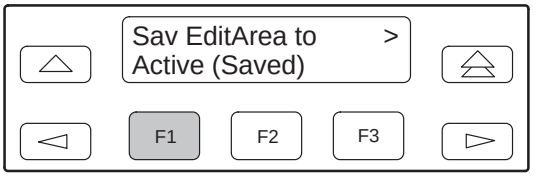


Scroll to the area you wish to load.

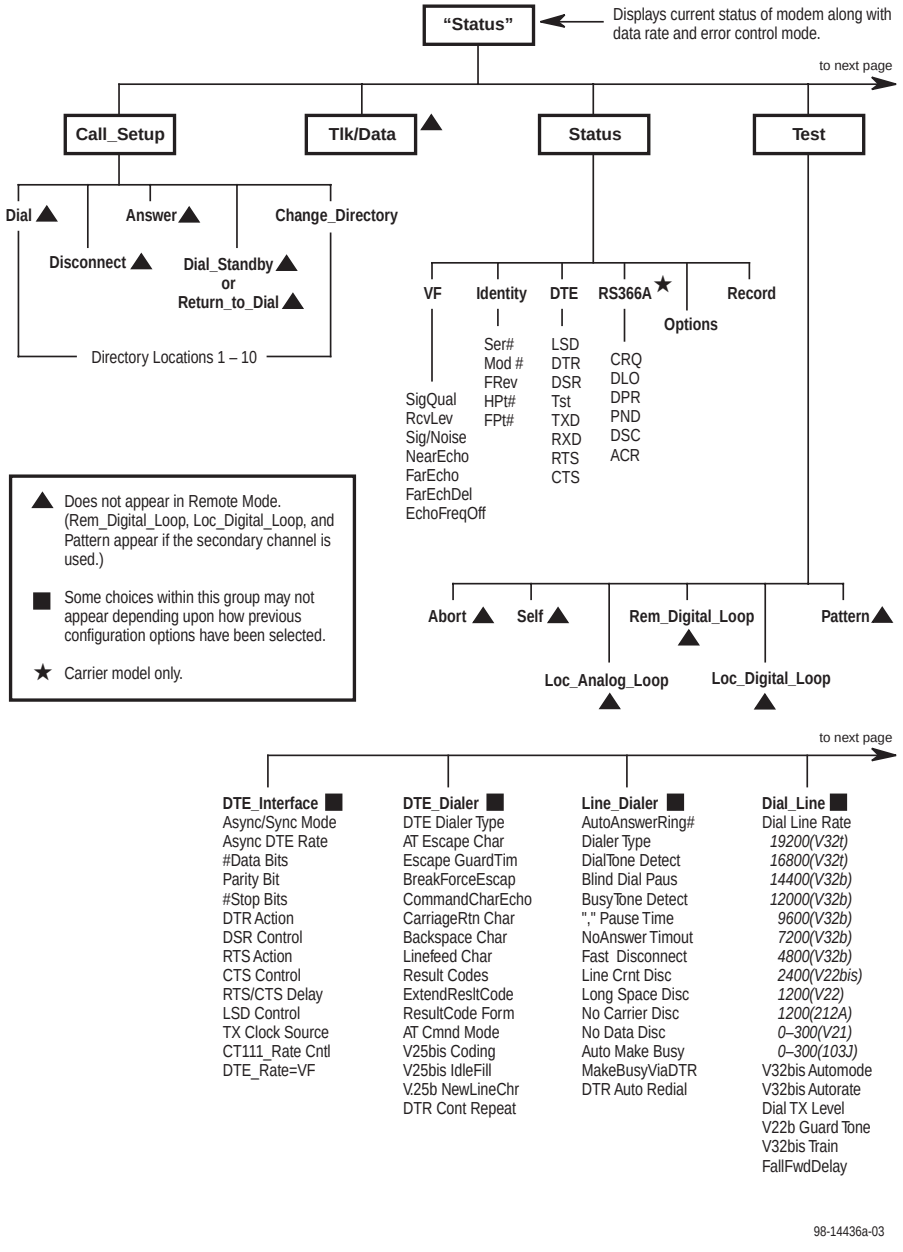
2. Select Edit to choose the set of configuration options to be edited: DTE Interface, DTE Dialer, Line Dialer, Dial Line, Leased Line, V.42/MNP/Buffer, Tests, Misc, or Security.

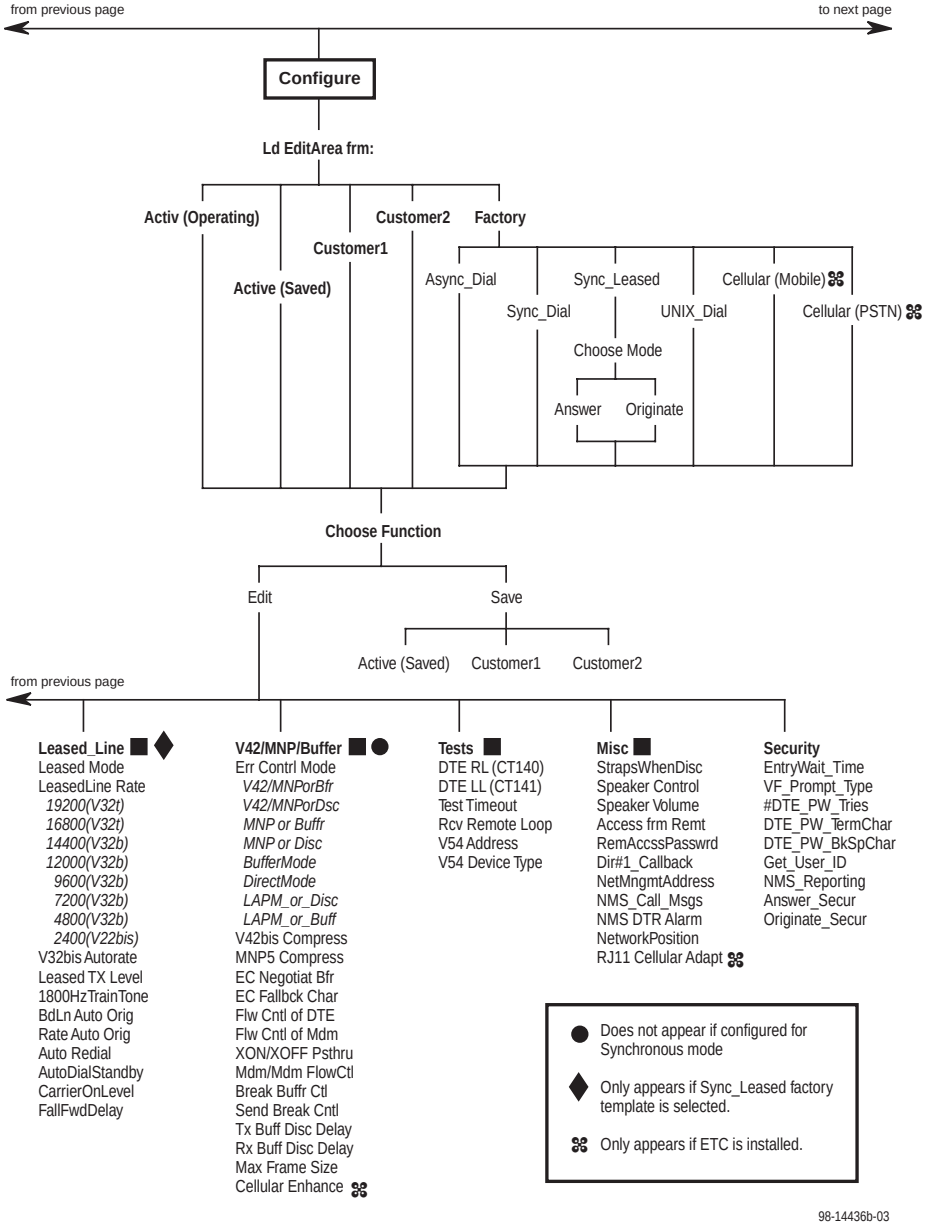


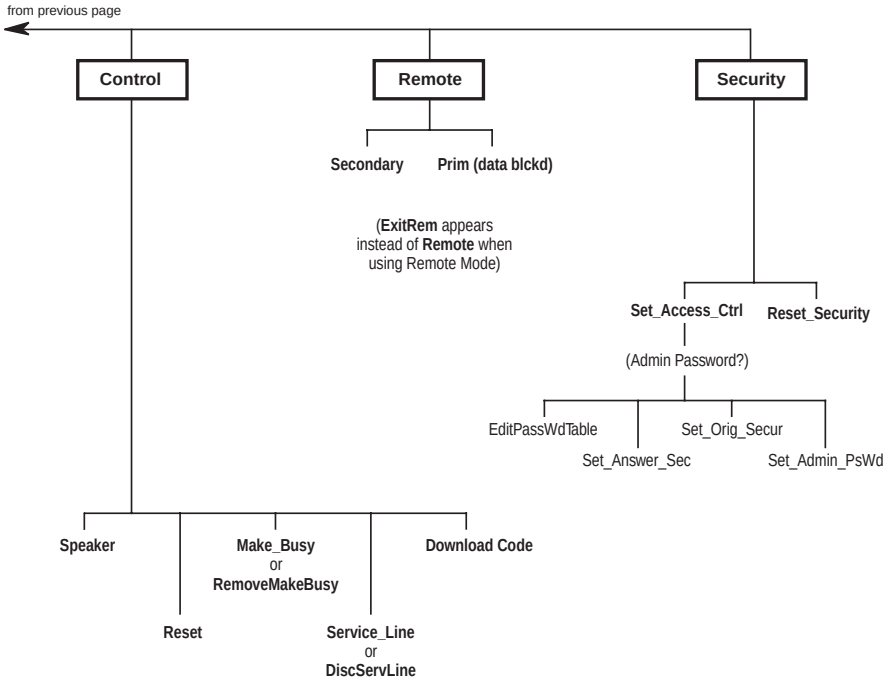
3. When the new configuration is completed, Save the edited configuration options to the desired configuration area: Active (Saved), Customer 1, Customer 2.



3800 Modems Menu Tree




from previous page
to next page
Configure
Ld EditArea frm:
Activ (Operating)
Active (Saved)
Customer1
Customer2
Factory
Async_Dial
Sync_Dial
Sync_Leased
UNIX_Dial
Cellular (Mobile)
Cellular (PSTN)
Choose Mode
Answer
Originate
Choose Function
Edit
Save
Active (Saved)
Customer1
Customer2
from previous page
Leased_Line
Leased Mode
LeasedLine Rate
19200(V32t)
16800(V32t)
14400(V32b)
12000(V32b)
9600(V32b)
7200(V32b)
4800(V32b)
2400(V22bis)
V32bis Autorate
Leased TX Level
1800HzTrainTone
BdLn Auto Orig
Rate Auto Orig
Auto Redial
AutoDialStandby
CarrierOnLevel
FallFwdDelay
V42/MNP/Buffer
Err Contrl Mode
V42/MNPorBfr
V42/MNPorDsc
MNP or Buffr
MNP or Disc
BufferMode
DirectMode
LAPM_or_Disc
LAPM_or_Buff
V42bis Compress
MNP5 Compress
EC Negotiat Bfr
EC Fallbck Char
Flw Cntl of DTE
Flw Cntl of Mdm
XON/XOFF Psthru
Mdm/Mdm FlowCtl
Break Buffr Ctl
Send Break Cntl
Tx Buff Disc Delay
Rx Buff Disc Delay
Max Frame Size
Cellular Enhance
Tests
DTE RL (CT140)
DTE LL (CT141)
Test Timeout
Rcv Remote Loop
V54 Address
V54 Device Type
Misc
StrapsWhenDisc
Speaker Control
Speaker Volume
Access frm Remt
RemAccssPasswrd
Dir#1_Callback
NetMngmtAddress
NMS_Call_Msgs
NMS DTR Alarm
NetworkPosition
RJ11 Cellular Adapt
Security
EntryWait_Time
VF_Prompt_Type
#DTE_PW_Tries
DTE_PW_TermChar
DTE_PW_BkSpChar
Get_User_ID
NMS_Reporting
Answer_Secur
Originate_Secur
Does not appear if configured for Synchronous mode
Only appears if Sync_Leased factory template is selected.
Only appears if ETC is installed.
98-14436b-03


from previous page
Control
Remote
Security
Secondary
Prim (data blckd)
(ExitRem appears instead of Remote when using Remote Mode)
Set_Access_Ctrl
Reset_Security
(Admin Password?)
EditPassWdTable
Set_Orig_Secur
Set_Answer_Sec
Set_Admin_PsWd
Speaker
Make_Busy or RemoveMakeBusy
Download Code
Reset
Service_Line or DiscServLine

98-14436c-03

Configuration Option Procedures — AT Commands

Loading Factory Configurations

Use the AT&F***y***&W***n*** command to load a factory configuration to either the Active (Saved), Customer 1, or Customer 2 configuration area.

Type: AT&F***y***&W***n***

where: ***y*** is one of the following factory configurations:
0 = Async Dial
1 = Sync Dial
2 = Sync Leased (Answer)
3 = UNIX Dial
4 = Sync Leased (Originate)
5 = Cellular (Mobile) (Valid only if ETC is installed)
6 = Cellular (PSTN) (Valid only if ETC is installed)

where: ***n*** is one of the following configuration areas:
0 = Active (Saved)
1 = Customer 1
2 = Customer 2

Loading Configuration Areas to Active (Operating)

Use the ATZ***n*** command to load stored configurations from Active (Saved), Customer 1, or Customer 2 configuration areas to Active (Operating).

Type: ATZ***n***

where: ***n*** is one of the following:
0 = Active (Saved)
1 = Customer 1
2 = Customer 2
3 = Active (Saved) + Reset

AT COMMANDS

Bold text indicates Async Dial factory defaults.

AT	Attention Command Prefix/Autobaud Rate. Indicates a command string has started and determines the DTE's data rate and parity.
A/	Repeat Last Command. Re-executes last command string. (Not to be preceded with AT or followed by pressing Enter.)
A	Answer Mode. Goes off-hook and attempts to establish a connection without waiting for a ring.
B*n*	*ITU-T/Bell Mode*
B0	V.21 or V.22 (300 or 1200 bps).
B1	Bell 103 or 212A (300 or 1200 bps).
D*n*	Dial. Dials the telephone number entered for *n*.
DS=*n*	Dial Stored Number. Dials the number stored in location *n* (1–10).
En	*Command Character Echo*
E0	Disables echo to the DTE.
E1	**Enables echo to the DTE.**
H0	Modem goes on-hook.
H1	Modem goes off-hook.
I0	Displays product code–144.
I1	Displays 3-digit firmware revision number.
I2	Performs an EPROM check.
I3	Displays modem's serial number.
I4	Displays modem's model number.
I5	Displays part number of circuit card.
I6	Displays firmware release number.
I9	(same as I1)
I10=*n*	Changes value of product code (0=144, 1=240, 2=480, 3=960, 4=120).
I11	Firmware checksum.
I19	Displays entire firmware revision number.
Ln	*Speaker Volume*
L0,L1	Selects low volume.
L2	**Selects medium volume.**
L3	Selects high volume.
Mn	*Speaker ON/Off Control*
M0	Speaker always Off.
M1	**Speaker ON until carrier signal becomes active.**
M2	Speaker always ON.
O	Returns modem to Data mode from online Command mode.
P	Enables Pulse Dial mode.

AT COMMANDS *(continued)*

Qn	*Result Codes*
Q0	**Enables result codes. Refer to *Result Codes* section.**
Q1	Disables result codes.
Q2	Enables originate modem to send result codes to the DTE. Required for most UNIX applications.
S*r*?	Displays value of S-Register (where *r* is the register number).
S*r*=*n*	Change S-Register. Changes the contents of the S-Register (where *r* is the register number and *n* is the assigned value).
T	Enables Tone Dial mode.
Vn	*Result Code Format*
V0	Displays as digits (Numbers 1).
V1	**Displays as text.**
V2	Displays as digits (Numbers 2).
Xn	*Extended Result Codes; Dial Tone Detect; Busy Tone Detect*
X0	Disables extended result codes 5–16, dial tone detect, and busy tone.
X1	Enables extended result codes 5–16, disables dial tone detect and busy tone detect. Refer to *Result Codes* section.
X2	Enables extended result codes 5–16, dial tone detect, and disables busy tone detect.
X3	Enables extended result codes 5–16, disables dial tone detect and enables busy tone detect. Refer to *Result Codes* section.
X4	**Enables extended result codes 5–16, dial tone detect, and busy tone detect. Refer to *Result Codes* section.**
X5	Adds EC suffix to extended result codes (20–27) if error control is used, enables dial tone detect and busy tone detect.
X6	Adds either V.42 or MNP suffix to extended result codes (20–27) if data compression is used, enables dial tone detect, and busy tone detect.
X7	DTE rate appears in CONNECT message instead of line rate, enables dial tone detect and busy tone detect. Refer to *Result Codes* section.
Yn	*Long Space Disconnect*
Y0	Disable.
Y1	**Enable.**
Zn	*Reset and Load Active*
Z0	Loads contents of Active (Saved) into Active (Operating).
Z1	Loads contents of Customer 1 into Active (Operating).
Z2	Loads contents of Customer 2 into Active (Operating).

AT COMMANDS *(continued)*

Z3 Loads contents of Active (Saved) into Active (Operating) and performs a reset.
Z9 Performs a full modem reset.

&Cn LSD Control
&C0 Forced On. Forces LSD ON at all times.
&C1 Standard RS232. LSD is ON when the remote modem's carrier signal is detected. LSD is Off when carrier signal is not detected.
&C2 Wink When Disc. LSD, normally forced ON, turns Off for approximately 1 to 2 seconds upon disconnect.
&C3 Follows DTR. State of LSD follows state of DTR.
&C4 Simulated Control Carrier. State of LSD follows state of remote modem's RTS.
&C5 =DTR/DiscOff. State of LSD follows state of DTR except upon a disconnect where DTR remains ON and LSD turns Off. DTR must then toggle Off and ON to turn LSD ON. Required for AT&T DATAKIT dial-out applications.
&C6 Bridge Retrain. LSD behaves as in Standard RS232, except that it is turned Off when retrain lasts longer than 10 seconds, and ON when no retrain is detected for 10 seconds.

&Dn DTR Action
&D0 Ignore. Modem ignores the DTR (Data Terminal Ready) signal and treats it as always ON.
&D1 Off=Command Mode. Modem enters online Command mode when DTR is lowered.
&D2 Standard RS232. DTR signal is controlled by the DTE.
&D3 Off=Reload Straps. Modem loads Active (Operating) area with Active (Saved) area when DTR is lowered.
&D4 Controls On-Hook. Modem does not disconnect until DTR lowered by DTE.
&D5 Controls Tx Mute. Transmitter output muted when DTR is lowered.

&Fn Loads Factory Configuration
&F0 Loads Async Dial factory configuration options into Active (Operating) configuration area.
&F1 Loads Sync Dial factory configuration options into Active (Operating) configuration area.
&F2 Loads Sync Leased (Answer Mode) factory configuration options into Active (Operating) configuration area.
&F3 Loads UNIX Dial factory configuration options into Active (Operating) configuration area.
&F4 Loads Sync Leased (Originate Mode) factory configuration options into Active (Operating) configuration area.
&F5 Cellular (Mobile). Valid only if ETC is installed.

AT COMMANDS *(continued)*

&F6 Cellular (PSTN). Valid only if ETC is installed.

&Gn V.22bis Guard Tone
&G0 Disables guard tone.
&G1 Sets guard tone to 550 Hz.
&G2 Sets guard tone to 1800 Hz.

&In Dial Transmit Level
&I10 –10 dBm.
&I11 –11 dBm.
• •
• •
&I32 –32 dBm.
&I99 ETC 1.0 (Cellular). Valid only if ETC is installed.
&I100 ETC 1.1 (Cellular). Valid only if ETC is installed.

&Jn Dial Transmit Level Type
&J0 Modem sets dial transmit level to Permissive mode at –9 dBm.
&Ln Leased-Line Mode
&L0 Disables leased-line operation.
&L1 2-wire originate leased-line operation.
&L2 4-wire originate leased-line operation.
&L3 2-wire answer leased-line operation.
&L4 4-wire answer leased-line operation.

&Mn,&Qn Async/Sync Mode and DTE Dialer Type
&M0,&Q0 Modem operates in Asynchronous mode and uses AT command protocol.
&M1,&Q1 Modem operates in Synchronous mode and uses AT command protocol.
&M2,&Q2 Modem operates in Synchronous mode and dials telephone number stored in directory location 1 when DTR signal turns Off and then ON.
&M3,&Q3 Modem operates in Synchronous mode and uses AT command protocol.
&Q4 Modem operates in Asynchronous mode and uses AT Command protocol; Hayes AutoSync is enabled.
&M231, &Q231 Modem operates in Asynchronous mode; the DTE Dialer Type is disabled.
&M232, &Q232 Modem operates in Asynchronous mode; V.25bis Async dialing is enabled.
&M233, &Q233 Modem operates in Synchronous mode; V.25 Bisync dialing is enabled.
&M234, &Q234 Modem operates in Synchronous mode; V.25bis HDLC dialing is enabled.
&M235, &Q235 Modem operates in Asynchronous mode; AT&T Exclusive dialing is enabled.
&M236, &Q236 Modem operates in Synchronous mode; the DTE Dialer Type is disabled.

&Rn RTS Action
&R0 Standard RS232. RTS action is controlled by DTE.
&R1 Ignores RTS. Modem ignores RTS signal and treats it as always ON.

AT COMMANDS *(continued)*

&R2	Simulated Control Carrier. State of RTS follows state of LSD.
&Sn	*DSR Control*
&S0	**Forced On. Forces DSR signal ON.**
&S1	Standard RS232. Modem controls DSR signal.
&S2	Wink When Disc. DSR signal turns Off for approximately 1 to 2 seconds upon disconnecting.
&S3	Follows DTR. Modem sends DSR to DTE when it receives DTR from DTE.
&S4	On Early. DSR is Off when modem is in idle state. DSR goes ON when modem enters Data mode.
&S5	Delay to Data. DSR does not turn ON until the modem enters Data mode.
&S6	Dial Backup toggle.
&Tn	*Tests*
&T0	Stops any test in progress.
&T1	Starts a Local Analog Loopback test (V.54, L3).
&T2	Transmits and receives a 511 BERT pattern.
&T3	Starts a Local Digital Loopback test.
&T4	Accepts request from remote modem for a Remote Digital Loopback test.
&T5	Denies request from remote modem for a Remote Digital Loopback test.
&T6	Starts a Remote Digital Loopback test (V.54, type L2).
&T7	Starts a Remote Digital Loopback test with a Pattern (V.54, type L2).
&T8	Starts a Local Analog Loopback test with a Pattern (V.54, type L3).
&T9	Starts a self-test.
&Vn	*View Configuration Options*
&V0	Displays Active (Operating) configuration options.
&V1	Displays Active (Saved) configuration options.
&V2	Displays Customer 1 configuration options.
&V3	Displays Customer 2 configuration options.
&V4	Displays telephone numbers stored in directory locations 1–10.
&Wn	*Write (Save to Memory)*
&W0	Saves current configuration options in Active (Operating) to Active (Saved).
&W1	Saves current configuration options in Active (Operating) to Customer 1.
&W2	Saves current configuration options in Active (Operating) to Customer 2.
&Xn	*Transmit Clock Source*
&X0	**Modem provides internal clock source for synchronous data (Pin 15).**
&X1	Modem uses external source (Pin 24) for clock for synchronous data.

AT COMMANDS *(continued)*

&X2	Modem uses received signal as clock source for synchronous data.
&Zn=x	Modem stores telephone number *x* (and any dial modifiers) in directory location *n* (1–10). For example, the command AT&Z1=555-1234 stores the number 5551234 in directory location 1. To clear a telephone number from a memory location, issue *&Zn=x* without entering a telephone number.
\An	*Maximum Frame Size*
\A0	64
\A1	128
\A2	192
\A3	256
\A4	32
\A5	16
\Cn	*Error Control Negotiate Buffer*
\C0	**Data is not buffered during handshaking sequence.**
\C1	Data is buffered up to 4 seconds during handshaking sequence.
\C2	Data is not buffered during handshaking sequence; however, the modem switches to Buffer mode when it receives an error control fallback character.
\Dn	*CTS Control*
\D0	**Forced On. CTS is forced ON.**
\D1	Standard RS232 operation.
\D2	Wink When Disc. CTS turns Off for approximately 1 to 2 seconds upon disconnecting.
\D3	Follows DTR. The state of CTS follows the state of DTR.
\Gn	*Modem-to-Modem Flow Control*
\G0	**Disables modem-to-modem flow control.**
\G1	Enables modem-to-modem flow control.
\Kn	*Break Buffer Control, Send Break Control, Break Forces Escape*
\K0	Discards data, sends break before data, and enables break forces escape.
\K1	Discards data, sends break before data, and disables break forces escape.
\K2	Keeps data, sends break before data, and enables break forces escape.
\K3	Keeps data, sends break before data, and disables break forces escape.
\K4	Keeps data, sends data before break, and enables break forces escape.
\K5	**Keeps data, sends data before break, and disables break forces escape.**
\K6	Discards break, disables break forces escape.
\Nn	*Error Control Mode*
\N0	Buffer Mode. Modem does not use error control; DTE rate can differ from VF rate.

AT COMMANDS *(continued)*

\N1 Direct Mode. Modem does not use error control; DTE rate and VF rate must be the same.
\N2 MNP or Disc. Modem disconnects if it does not connect in MNP mode.
\N3 MNP or Buffer. Modem connects in Buffer mode if it does not connect in MNP mode.
\N4 V.42/MNP or Disc. Modem disconnects if it does not connect in V.42 or MNP mode.
\N5 V.42/MNP or Buffer. Modem connects in Buffer mode if it does not connect in V.42 or MNP mode.
\N6 LAPM or disconnect.
\N7 LAPM or buffer.

\Q*n* *Flow Control of DTE*
\Q0, \Q5, \Q6
Disables flow control of DTE.
\Q1, \Q4 Enables XON/XOFF flow control.
\Q2, \Q3 **Modem raises and lowers CTS to start and stop flow control.**

\Q*n* *Flow Control of Modem*
\Q0, **\Q2,** \Q4
Disables flow control of modem.
\Q1, \Q5 Enables XON/XOFF flow control.
\Q3, \Q6 Modem starts and stops flow control based upon state of DTE's RTS signal.

\T*n* *No Data Disconnect Timer*
\T0 Disables no data disconnect timer.
\Tn Sets no data disconnect timer to a value from 1 minute to 255 minutes.

\X*n* *XON/XOFF Passthrough*
\X0 Disables transmission of flow control characters to remote modem.
\X1 Enables transmission of flow control characters to remote modem.

%A*n* Sets error control fallback character *n* to an ASCII value from 0 to 127.

%B*n* Sets data rate to *n* (300 to 19200).

%Cn *MNP 5 Data Compression*
%C0 Disables MNP5 data compression.
%C1 Enables MNP5 data compression.

%R*n* Sets DTE rate to *n* (300 to 115200).

″*Hn* *V.42 bis Data Compression*
″H0 Disables V.42bis data compression.
″H1 Enables V.42bis data compression for transmit only.
″H2 Enables V.42bis data compression for receive only.
″H3 Enables V.42bis data compression in both the transmit and receive directions.

RESULT CODES

Numbers(1)	Numbers(2)	Words
0	0	OK
1	1	CONNECT
2	2	RING
3	3	NO CARRIER
4	4	ERROR

Result Codes 5–14, 16, 19 are enabled with the X1, X2, X3, and X4 commands.

5	5	CONNECT 1200
6	6	NO DIALTONE
7	7	BUSY
8	8	NO ANSWER
10	10	CONNECT 2400
11	11	CONNECT 4800
12	12	CONNECT 9600
13	16	CONNECT 12000
14	13	CONNECT 14400
15	14	CONNECT 19200
16	15	CONNECT 7200
17	17	CONNECT 16800
19	19	CONNECT 300

Result Codes 20–27 are enabled with the X5 command (EC suffix) or the X6 command (V.42 or MNP suffix).

20	10	CONNECT 2400/EC
21	11	CONNECT 4800/EC
22	12	CONNECT 9600/EC
23	16	CONNECT 12000/EC
24	13	CONNECT 14400/EC
25	17	CONNECT 16800/EC
26	15	CONNECT 7200/EC
27	5	CONNECT 1200/EC
29	14	CONNECT 19200/EC

Result Codes 15, 28–34 are enabled with the X7 command (DTE rate suffix).

28	28	CONNECT 38400
30	30	CONNECT 57600
32	32	CONNECT 76800
34	34	CONNECT 115200

DIAL COMMAND MODIFIERS

T	Tone Dial (DTMF)
P	Pulse Dial
,	Pause
W	Wait for Dial Tone
R	Reverse Dial
@	Quiet Answer
!	Hook Flash
;	Return to Command Mode

S-REGISTERS

Register	Description	Factory Setting	Range
S0	Auto-Answer Ring Number	1	0(Disable) or 1–255 rings
S2	AT Escape Character	43(+)	0–127 ASCII
S3	Carriage Return Character	13	0–127 ASCII
S4	Line Feed Character	10	0–127 ASCII
S5	Backspace Character	8	0–127 ASCII
S6	Blind Dial Pause	2	2–255 seconds
S7	No Answer Time-out	45	1–255 seconds
S8	"," Pause Time for the Dial Modifier	2	0–255 seconds
S10	No Carrier Disconnect	2	0–254 (10ths of a second) or 255(Disable)
S12	Escape Guard Time	50	0–255 in 20-millisecond increments
S18	Test Time-out	0(disabled)	0–255 seconds
S26	RTS/CTS Delay	0	0–255 seconds
S34	1800 Hz Training Tone	0	0(Disable); 1(Enable)
S35	Auto Redial (Leased Line)	0	0(Disable) or 1(dirs 1–2) – 9(dirs 1–10)
S36	Rate Auto Originate	0	0(Disable) or 1(4800) – 6(16,800)
S37	Auto Redial (DTR)	0	0(Dir 1) – 9(Dirs 1–10)
S38	DTR Cont Repeat	0	0=Disable, 1=Enable
S39	Receive Buffer Disconnect Delay	0	0(Disable) or 1–255 seconds
S40	Auto Make Busy	0	0=Disable, 1=Enable
S41	Dial Line Rate	21	1=14400(V.32bis); 2=12000(V.32bis); 3=9600(V.32bis); 4=7200(V.32bis); 5=4800(V.32bis); 6=2400(V.22bis); 7=1200(V.22); 8=1200(212A); 10=0–300(V.21); 11=0–300(103J); 20=19200(V.32terbo); 21=16800(V.32terbo)
S43	V.32bis Train	0	0=Long; 1=Short
S44	Leased-Line Rate	18	1=14400(V.32bis); 2=12000(V.32bis); 3=9600(V.32bis); 4=7200(V.32bis); 5=4800(V.32bis); 6=2400(V22bis); 18=19200(V.32terbo); 19=16800(V.32terbo)
S45	Leased TX Level	0	0 dBm–15 dBm
S46	Bad Lines Auto Originate	0	0=Disable; 1=30 seconds; 2=20 seconds; 3=60 seconds; 4=90 seconds; 21=600 seconds
S47	Auto Dial Standby	0	0=Disable; 1=15 minutes; 2=1 hour; 3=4 hours; 255=Test(2min)
S48	Leased-Line Carrier On Level	0	0=–43 dBm; 1=–26 dBm
S49	Transmit Buffer Disconnect Delay	10	0=Disable or 1–255 in 1-second increments
S51	DTE RL (CT140)	0	0=Disable; 1=Enable
S52	DTE LL (CT141)	0	0=Disable; 1=Enable
S53	V.54 Address	0	0(Disable) or 1–34

S-REGISTERS *(continued)*

Register	Description	Factory Setting	Range
S54	V.54 Device Type	0	0=Peripheral; 1=Intermediate
S55	Access from Remote	0	0=Enable; 1=Disable
S56	Remote Access Password 1st and 2nd digits	00	00–99
S57	Remote Access Password 3rd and 4th digits	00	00–99
S58	Remote Access Password 5th and 6th digits	00	00–99
S59	Remote Access Password 7th and 8th digits	00	00–99
S61	CT111 Rate Control	0	0=Disable; 1=Fallback 1; 2=Fallback 2
S62	V.25bis Coding	0	0=ASCII; 1=EBCDIC
S63	V.25bis Idle Character	0	0=Mark; 1=Flag
S64	V.25bis New Line Character	0	0=CR+LF; 1=CR; 2=LF
S65	Line Current Disconnect	0	0=Enable (>8 msec); 1=Enable (>90 msec); 2=Disable
S66	NMS Call Messages	0	0=Call Connect & Progress; 1=Disable; 2=Call Connect Only; 3=Call Progress Only
S67	Directory Location 1 Callback	0	0=Disable; 1=Enable
S69	Make Busy Via DTR	0	0=Disable; 1=Enable
S74	Network Position	0	0=Tributary; 1=Control
S75	Network Management Address	255	0–255 (001–256)
S76	V.32bis Dial Autorate	0	0=Enable; 1=Disable; 2=Start at 4800 bps; 3=Start at 9600 bps
S77	DTR Alarm Reporting	0	0=Disable; 1=Enable
S78	V.32bis Dial Automode	0	0=Enable; 1=Disable; 2=System85
S80	No Data Disc Trigger Signal	3	0=RX or TX; 1=TX; 2=RX; 3=TX and RX
S81	Leased Line Signal Quality Retrain	0	0(Disable) or 1–5 seconds
S82	V.32bis Leased Autorate	0	0=Enable; 1=Disable
S84	AT Command Mode	0	0=Normal; 1=No Error; 2=No Strap or ERROR
S85	Fast Disconnect	0	0=Disable; 1=Enable
S88	Straps When Disconnected	0	0=No Change; 1=Reload; 2=Reload, No Change
S89	V.42 ARQ Window Size Increase	0	0(6 frames) – 9(15 frames)
S90	DTE Rate = VF Rate	0	0=Disable; 1=Enable
S91	Cellular Enhancements	0	0=Disable; 1=Enable
S93	RJ11 Cellular Adapt	0	0=Disable; 1=Enable